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L7	lexible housing and filter and l1	0	L7
L6	lfexible bag and l1	0	L6
L5	flexible vessel and l1	0	L5
L4	flexible container and l1	0	L4
L3	l1 and flexible same container	6	L3
L2	L1 and flexible same vessel	0	L2
L1	filter same perforated and angle same perforations	183	L1

L1: Entry 4 of 183 File: USPT Jul 6, 2004

DOCUMENT-IDENTIFIER: US 6758344 B2
TITLE: Self-cleaning fluid filter system

Detailed Description Text (6):
The filter sock 34 is wrapped with an outer layer 39 made from a metal or plastic mesh-like material or perforated sheet material. The outer layer 39 protects the filter sock 34 from tearing while inserting the pump 14 and filter apparatus 12 in the well casing 18 or from snagging on rocks or sticks when the pump 14 is used in ponds or streams. The outer layer 39 also limits deformation of the filter sock 34 from the force of the blast of air during the cleaning process.

Detailed Description Text (13):
Each tube 38 contains a number of perforations or jets 80 therein. When pressurized air is inserted into the tubes 38, the air escapes out the perforations 80. In one embodiment, the perforations 80 are arranged in two rows spaced about 180 degrees apart around the tube 38 to direct the burst of air along the inner surface of the filter sock 34. Alternatively, the rows of perforations 80 can be placed at angles less than 180 degrees apart to direct the air blasts more directly against the filter sock 34. The perforations 80 are longitudinally spaced along the hollow tubes 38 to provide air bursts along substantially the entire length of the hollow tubes 38. In one embodiment, the perforations 80 are spaced approximately every three inches along the tube 38 of about three inches between perforations, however, other spacing can be used.

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L14: Entry 3 of 4 File: USPT May 3, 1977

DOCUMENT-IDENTIFIER: US 4021354 A
TITLE: Pressure filter

Brief Summary Text (4):
The prior art is replete with filtering devices which have many different kinds of filtering media and which may or may not utilize positive pressure or vacuum in the filtration process. For example, U.S. Pat. No. 1,312,041 to Morison discloses perforated filter baskets suspended in a housing and covered on their outside surfaces with a filtering material in the form of a flexible bag. However, the filter baskets of Morison are not adapted to utilize pressure or vacuum and are not suitable for use with sterile slurries.

Brief Summary Text (5):
U.S. Pat. No. 2,174,265 to Holt and U.S. Pat. No. 2,603,356 to Hisey both disclose filtering devices in which the filtering media is a flexible planar piece of filter paper which is peripherally secured on a rim-like structure. However, such a flexible type of filter paper requires the use of complex means to secure its peripheral edge and to support its bottom surface, and such elaborate securing and supporting means are disadvantageous. Likewise, U.S. Pat. No. 2,584,206 discloses planar filtering elements which are peripherally supported in a housing made of a rubber-like material. Such a filter is not suitable for use with sterile slurries as particles from the rubber-like material, arising perhaps from the degradation of the material, will contaminate the slurry.

Detailed Description Text (9):
The ability of the distribution plate 56 to support the weight of the filter plate 50 and the materials thereon without bowing or deformation of the filter plate 50 is further enhanced by welding to the bottom surface of the distribution plate 56 a plurality of reinforcing ribs 60 and 61. These ribs 60 and 61, as applied to the bottom surface of the distribution plate 56, are each in the form of an inverted T having a vertically extending flange 62 welded at its upper end to the bottom surface of the plate 56 and welded at its lower end to a flange 64 which is parallel to the plate 56 and perpendicular to the plane of the flange 62, as seen in FIGS. 1 and 3. Of course, the T-shaped reinforcing ribs 60 and 61 could be formed in one piece rather than by welding two separate flanges 62 and 64 together. As illustrated, in FIG. 4, the reinforcing ribs 60 applied to the bottom surface of the distribution plate 56 extend in one direction along a chord of the plate 56 while the reinforcing ribs 61 extend along a chord of the plate 56 in a direction at right angles with respect to the ribs 60 and thus the ribs 61 intersect with the ribs 60. The reinforcing ribs 60 are continuous over their entire length while the intersecting ribs 61 are necessarily made of a plurality of colinear sections which are suitably fitted between and on the sides of the ribs 60.

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L8: Entry 1 of 1 File: USPT Dec 17, 2002

DOCUMENT-IDENTIFIER: US 6495366 B1
TITLE: Uninterrupted flow pump apparatus and method

Abstract Text (1):
This invention describes a method for pumping or delivering fluids utilizing a flexible vessel subject to controlled pressures within another pressure vessel. The pressure vessel can be sourced with positive and/or negative (e.g., vacuum) pressure.

Brief Summary Text (3):
The present invention relates to a method and apparatus for pumping or delivering fluids utilizing a flexible vessel that may be subject to controlled pressures and preferably located within a pressure vessel.

Brief Summary Text (14):
The objects of the invention include providing a method and apparatus for providing a uniform and controlled flow of fluid. The invention relates to an apparatus and method for pumping or delivering fluids utilizing a flexible vessel subject to controlled pressures within an outer pressure chamber.

Detailed Description Text (4):
In accordance with the invention, as depicted in a particular embodiment, for example, in FIG. 1, the present invention can be accomplished by disposing a sealed flexible chamber within an outer chamber 30. As explained above, this flexible chamber 20 can be any flexible sealed container. As depicted in FIG. 1, flexible chamber 20 is a flexible fluid container bag which can be disposable, however the invention is not limited to this type of bag and can comprise any type of sealed chamber or flexible membrane that can be compressed and/or expanded when pressure (or vacuum) is applied to it. The outer chamber of FIG. 1 is depicted as a standard glass bottle but can be any pressure containing device or apparatus, including a plastic or other molded housing or other type container, such as, for example, might be used to house an entire pump system or other such medical device, or may be a molded plastic cassette.

Detailed Description Text (22):
The system in step 5100 applies -200 mm Hg of pressure to the plasma chamber 320, then opens valves 7, 8, 9 and 11. Red cells that remained in the centrifuge bowl 180 flow into the plasma container 240 bottom and sterile air is pulled from the buffy coat container 250. When the centrifuge bowl 180 is empty, as detected in step 5110, the system in step 5120 closes valves 8, 9 and 11 and applies a return pressure to the plasma chamber 320. The return pressure is a positive pressure measurement set by the operator. In step 5130, valves 3, 5 and 7 are opened, and red cells and plasma are returned to the patient 902 via the internal filter 160. When the plasma container 240 is empty, as detected in step 5140, the system in step 5150 closes all valves and the drawing process is complete.

Detailed Description Text (24):
The treated buffy coat is then re-infused into the patient 902, which process is

depicted, for example, in FIGS. 9A and 9B. The system in step 10010 applies -100 mm Hg of pressure to the buffy coat chamber 330 and the plasma chamber 320, and opens valves 6, 7, 11 and 12. Buffy coat then flows from the receiver container 940 via the photoactivation plate 190 into the buffy coat container 250, and saline flows into the plasma container 240. When the buffy coat container 250 is full and 100 ml saline has been collected in the plasma container 240 as detected in step 10020, the system in step 10030 closes valves 6, 7 and 11. Pressure is applied to the buffy coat chamber 330 and the plasma chamber 320 (+100 mm Hg). The system opens valves 10 and 12, allowing saline to rinse the photoactivation plate 190. When the plasma container 240 is empty as detected in step 10040, the system in step 10050 closes valve 10, applies -100 mm Hg of pressure to the plasma chamber 320, and opens valves 10, 11 and 12. Saline rinse fluid and buffy coat flow into the plasma container 240. When the buffy coat container 250 is empty as detected in step 10050, the system in step 10060 closes valves 10, 11 and 12, applies return pressure to the plasma chamber 320 and opens valves 3, 5 and 7. The return pressure is a positive pressure measurement set by the operator. Treated buffy coat and rinse fluid flows from the plasma container 240 into the patient 902 through the internal filter 160. When the plasma container 240 is empty as detected in step 10070 reinfusion is complete.

Detailed Description Text (25):
In another embodiment, the present invention may be used in a peritoneal dialysis process. Peritoneal dialysis uses the peritoneal membrane, which is the thin tissue surrounding the internal organs of the abdomen, as a dialysis filter. To prepare for peritoneal dialysis, a surgeon permanently places a catheter into the abdomen. The catheter is used to deliver the dialysate fluid into the peritoneal cavity, and after the peritoneal cavity is filled with the dialysate, toxins and excess water flow from the blood through the peritoneal membrane into the dialysate. After the waste products have diffused into the dialysate, the fluid is drained from the cavity through the catheter. The composition of the dialysate can be modified for individual needs with the major difference in dialysate formulae being the amount of dextrose used as the osmotic agent (e.g., 1.5, 2.5, or 4.25 g/dl). A commonly used type of peritoneal dialysis is continuous cyclic peritoneal dialysis ("CCPD").

Detailed Description Text (33):
As shown, for example, in FIG. 4, the pumps of the present invention can be used in a biological fluid delivery system. As with the previously described embodiments, the sealed flexible chamber 20 is disposed within an outer chamber 30. Flexible chamber 20 is adapted to contain biological fluids for delivery to one in need thereof. For example, the biological fluid may be insulin for delivery to a diabetic patient. The sealed flexible chamber 20 is preferably sterile and may be pre-packaged with the biological fluid to be pumped or delivered. The outer chamber 30 of FIG. 4 surrounds the flexible chamber 20 and may comprise a plastic or other molded housing or other type container, such as, for example, might be used to house a medical device, or may be a molded plastic cassette. The outer chamber 30 may, in an alternative embodiment, also be surrounded by a housing 88. The housing 88 may serve to protect the outer chamber 30 and inner chamber 20, as well as providing means for attaching the pump to a surface or directly to a patient through use, for example, of an adhesive overlay 95 or other conventional attachment means. In a preferred embodiment, the adhesive overlay 95 is placed on the base of the pump and may also serve as a carrier for a topical antiseptic, antibiotic, or other agent for reduction of the possibility of infection or patient discomfort.

Detailed Description Text (34):
Each of the outer chamber 30 and the housing 88 preferably may be molded in one piece from a transparent material such as polymethlymethacrylate, polycarbonate, polysulfone, PVC, medium to high density polyethylene or other transparent or semi-transparent high modulus polymers which are heat resistant, chemically inert, and

preferably capable of withstanding sterilization conditions. Visual confirmation of the operational status of the pumps of the present embodiment may be facilitated by having the flexible chamber 20, outer chamber 30 and the optional housing 88 constructed of such semi-transparent or an transparent materials. The flexible chamber 20 may be provided with a septum 76, inserted through an opening in flexible chamber 20, outer chamber 30 and optionally housing 88, in sealing engagement therewith and adapted to be re-sealingly pierced by an inlet port 85, which may comprise, for example, a needle and associated cannula, for filling or adding biological fluid to the flexible chamber 20. For example, a needle could be attached to inlet port 85 with the inner end of the needle being of sufficient length to pierce septum 76 and provide a re-sealable fluid passageway from the interior of chamber 20 to the exterior of the pump.

Detailed Description Text (40):
Various embodiments of the pumps of the present invention, utilized for delivery of a biological fluid, can have different flow rates determined by the type of drug, the dosage of the drug and the specific design or size of the pump itself. It is contemplated that the partially assembled device would comprise the flexible chamber 20 surrounded by the outer chamber 30. The flexible chamber 20 may have associated with it, in fluid communication thereof, an outlet port 50 and an optional inlet port 85 and septum 76. In this embodiment, the prepackaged pumps may be provided in sterile form to the patient or health care provider to assemble the appropriate combinations.

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L1: Entry 1 of 3 File: USPT Nov 23, 2004

DOCUMENT-IDENTIFIER: US 6821790 B2
TITLE: Methods and apparatus for separation of biological fluids

Detailed Description Text (30):
In FIG. 2A a blood separation apparatus 110 has a soft-walled or otherwise flexible vessel 120 containing a network 145 formed from whole blood 130 comprising red blood cells 132 (not shown in detail), anti-red blood cell antibodies 142 (not shown in detail)and anti-mouse antibodies 144 (not shown in detail). A filter 160 filters out the network 145, and allows plasma 134 to pass through to a collection area.

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L1: Entry 3 of 3 File: USPT Dec 24, 1985

DOCUMENT-IDENTIFIER: US 4560382 A
TITLE: Medical container

Abstract Text (1):
In a medical container comprising a flexible vessel containing a fluid, inlet means attached to the vessel for admitting another fluid into the vessel, and an outlet, a tubular member is extended through the vessel wall as the inlet means and closed at the outer end with a plugging member to shut off the tubular member channel from the exterior and provided at the inner end with a bacterial filter, the plugging member permitting access to the tubular member channel from the exterior when the other fluid is to be admitted into the vessel. A breakable closure member is further mounted on the inner end of the tubular member to shut off the filter member from the interior space of the vessel, but is breakable to permit the communication of the interior space with the tubular member when the other fluid is to be admitted.

Brief Summary Text (16):
The present invention is directed to a medical container comprising a flexible vessel defining an interior space for containing a fluid, at least one inlet means provided across the wall of the vessel for admitting another fluid into the interior space for admixing, and outlet means for transferring the fluid out of the vessel. According to a first aspect of the present invention, the inlet means comprises a tubular member extending through the vessel wall and defining a channel in communication with the interior space. Plugging means is mounted on the tubular member for shutting off the channel in the tubular member from the exterior, and a bacterial filter member is attached to the tubular member on the side of the interior space with respect to the plugging means. The plugging means is able to permit access to the tubular member channel from the exterior when the other fluid is to be admitted into the interior space of the vessel.

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